CLAIMS

1. An antenna system for measuring azimuth and elevation angles of an active, signal sending radiosonde (31), which antenna system comprises

- a first passive antenna group (13) comprising at least two antenna arrays (11a, 11b), the direction pattern of which is wide at least in elevation plane for measuring azimuth angle of the radiosonde (31) based on the phase differences between the antenna arrays (11a, 11b),
- a second passive antenna group (12) comprising at least two antenna arrays (10a, 10b), the direction pattern of which is wide at least in elevation plane for measuring the elevation angle of the radiosonde (31) based on the phase differences between the antenna arrays (10a, 10b) and the rotational position of the antenna field (1), and
- at least one third antenna element (8) having high gain for receiving the telemetry signal, the direction pattern of which element (8) is narrow in azimuth plane and wide in elevation plane,

characterized in that

- first (13) and second (12) antenna groups form a solid antenna field (1), and
- antenna field (1) is fixedly tilted in a predetermined elevation position.

2. The antenna system of claim 1, **characterized** in that the third antenna (8) belongs to the antenna field (1).

3. The antenna system of claim 1 or 2, **characterized** in that the antenna field is essentially planar.

4. The antenna system of any of the previous claims or their combination, **characterized** in that the gain pattern minimum (35) (null) of each antenna array (10a, 10b, 11a, 11b) is aligned to the direction of the ground reflection (30).

5. The antenna system according to any previous claim or their combination, **characterized** in that the antenna system comprises means for rotating the antenna field (1) around vertical axis (7) approximately to the direction of the radiosonde (31) while the elevation angle remains essentially constant.

6. The antenna system according to any previous claim or their combination, **characterized** in that radiosonde (31) telemetry reception is independent of azimuth and elevation measurements.

7. The antenna system according to any previous claim or their combination, **characterized** in that the antenna field (14) is fixed in elevation and azimuth direction, and that the system comprises at least three antenna fields (14) pointing to different azimuth directions.

8. The antenna system of claim 7, **characterized** in that the gain pattern minimum (null) of each antenna array (17a, 17b, 18a, 18b) is aligned to the direction of the ground reflection.

9. The antenna system of claim 7 or 8, **characterized** in that radiosonde telemetry reception (15) is independent of azimuth and elevation measurements.

10. The antenna system according to any previous claim or their combination, **characterized** in that the antenna field (1) is fixedly tilted backwards.

11. The antenna system according to any previous claim or their combination, **characterized** in that the antenna field (1) forms an inverted letter T.

12. A method for measuring azimuth and elevation angles of an active, signal sending radiosonde (31), in which method

- the azimuth angle of the radiosonde (31) is measured based on the phase differences of the received radiosonde signals between the antenna arrays (11a, 11b) and the rotational position of the antenna field (1) with a first

passive antenna group (13) comprising at least two antenna arrays (11a, 11b), the direction pattern of which is wide at least in elevation plane,

- the elevation angle of the radiosonde (31) is measured based on the phase differences of the received radiosonde signals between the antenna arrays (10a, 10b) with a second passive antenna group (12) comprising at least two antenna arrays (10a, 10b), the direction pattern of which is wide at least in elevation plane, and

- the telemetry signal is received with at least one third antenna element (8) having high gain, the direction pattern of which element (8) is narrow in azimuth plane and wide in elevation plane,

characterized in that

- first (13) and second (12) antenna groups form a solid antenna field (1), and
- antenna field (1) is fixedly tilted in a predetermined elevation position.

13. The method of claim 12, **characterized** in that the third antenna (8) belongs to the antenna field (1).

14. The method according to any previous method claim or their combination, **characterized** in that the gain pattern minimum (null) of each antenna array (17a, 17b, 18a, 18b) is aligned to the direction of the ground reflection.

15. The method according to any previous method claim or their combination, **characterized** in that radiosonde telemetry reception is independent of azimuth and elevation measurements.

16. The method according to any previous method claim or their combination, **characterized** in that the antenna system is rotated around vertical axis (7) approximately to the direction of the radiosonde (31) while the elevation angle remains essentially constant.

17. The method according to any previous method claim or their combination, **characterized** in that the antenna field (1) is fixedly tilted backwards.

18. The method according to any previous method claim or their combination, **characterized** in that the antenna field (14) is fixed in elevation and azimuth direction, and that the system comprises at least three antenna fields (14) pointing to different azimuth directions.

19. The method according to claim 18, **characterized** in that the gain pattern minimum (null) of each antenna array (17a, 17b, 18a, 18b) is aligned to the direction of the ground reflection.

20. The method according to claim 18 or 19, **characterized** in that radiosonde telemetry reception (15) is independent of azimuth and elevation measurements.